Sept. 8, 1964 R. G. FREIDENRICH ETAL 3,147,843

APPARATUS FOR ORIENTING TERMINALS

Filed March 14, 1962

FIG-1

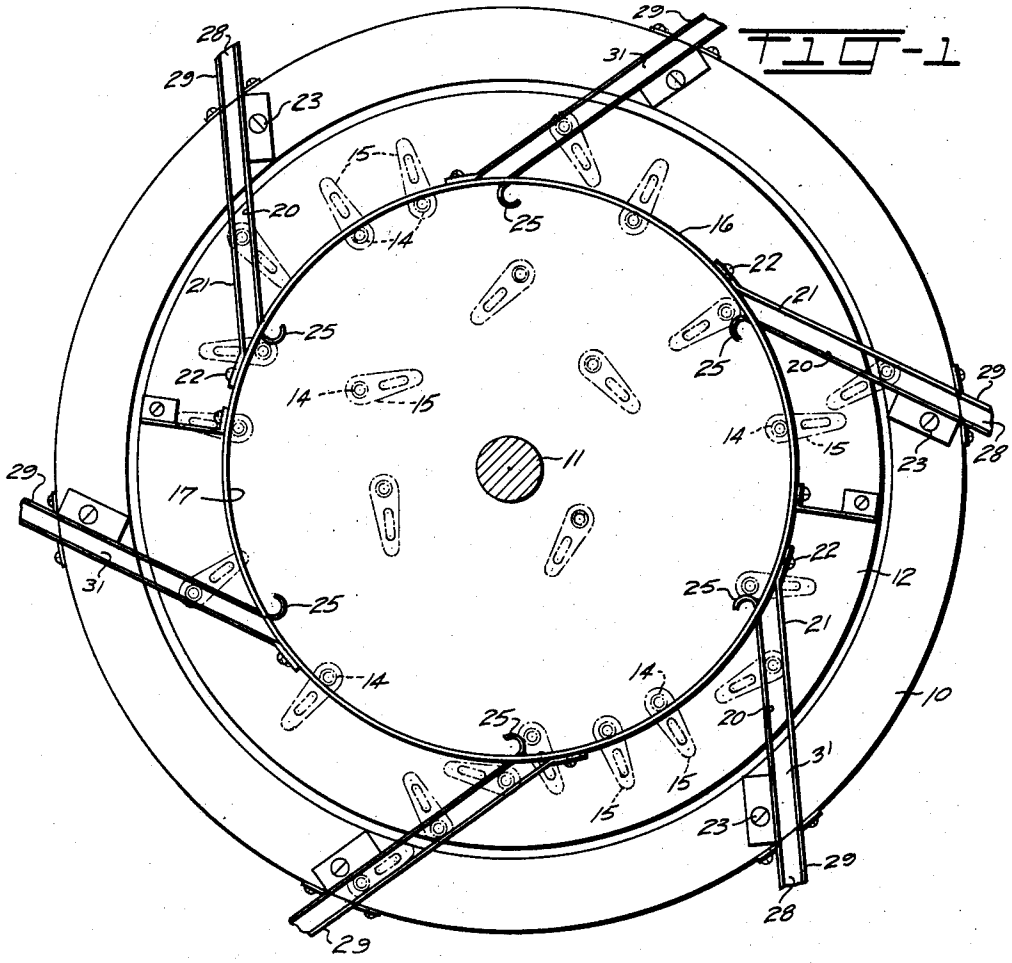
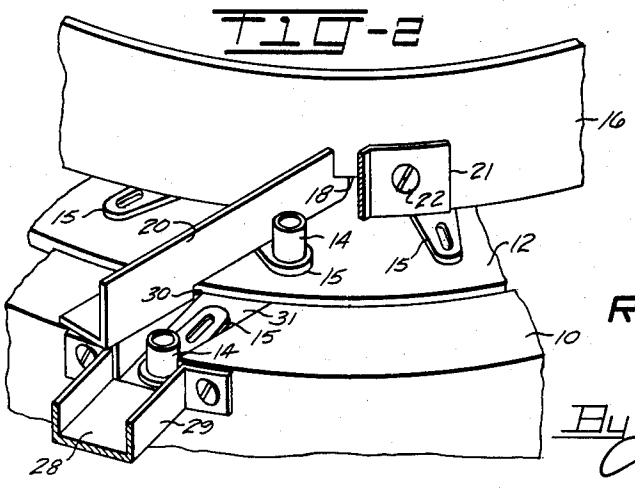


FIG-2



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United States Patent Office 3,147,843 Patented Sept. 8, 1964

3,147,843

APPARATUS FOR ORIENTING TERMINALS

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Filed Mar. 14, 1962, Ser. No. 179,729
3 Claims. (Cl. 198—33)

This invention relates to apparatus for orienting terminals, particularly terminals having laterally projecting tongues, and feeding the terminals to supply chutes.

Great numbers of terminals of this type are to be mounted in panels, component heads or the like and it has been found that these terminals may be mounted rapidly through the aid of certain commercially known machines providing the terminals are fed to the machines in a predetermined order. This, therefore, requires the need of an apparatus for orienting this particular type of terminal and directing terminals in great quantities successively in the oriented positions to one or more chutes where they may be directed to the mounting machines.

An object of the present invention is the provision of an apparatus which is simple in structure yet highly efficient in orienting terminals and feeding them successively to a chute.

According to the object, the invention includes an apparatus for orienting terminals having tongues extending laterally from like ends thereof and feeding the terminals to a chute comprising an annular wall mounted at a fixed position and having an outlet in its lower edge positioned above a rotatable disc-like table which is larger in diameter than the wall to cause the terminals within the area of the wall on the table to move outwardly so that the tongue portion of the terminal may extend beneath the wall and be moved along an inner surface of the wall until the terminals find the outlet.

More specifically, a stop is positioned adjacent to the outlet to momentarily hold the terminals moving into engagement with the stop so that through the assistance of centrifugal force they may be moved singly through the outlet. Also, a guide extends from the outlet to an entrance end of a chute so that the terminals moving on the outer portion of the table against the guide will be directed toward the chute. A ramp is interposed between the periphery of the table and the entrance end of the chute adjacent to which an orienting member is located at a fixed position to complete orientation of each terminal when moving down the ramp to the chute.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawing wherein:

FIG. 1 is a top plan view of the apparatus; and,

FIG. 2 is a fragmentary isometric view of a portion of the apparatus adjacent one of the outlets.

The apparatus has a fixed support **10** carrying a rotatable shaft **11**, which in the present instance, constitutes the power means for rotating a disc-like table **12** about its center which is coincident with the axis of the shaft **11**. The power means including the shaft **11**, may include also a motor drive (not shown) adapted to rotate the table **12** at a suitable speed to create a desired centrifugal force on a supply of terminals **14** to cause them to move outwardly on the table. The terminals **14** in the present instance are of a particular type having tongues **15** fixed to and extending laterally from like ends thereof.

An annular or cylindrical wall **16** of a desired height is disposed concentric with the shaft **11**, but is smaller in diameter than the table **12** so that a portion of the table of a given width extends beyond the periphery of the wall **16**. The wall **16** has an inner surface **17** against which the terminals are moved through the aid of centrifugal force and are advanced in clock-wise direction toward any of a series of six outlets **18** spaced about the wall and disposed in the lower portion thereof. Pairs of guides **20** and **21** are provided for the outlets **18** and are fixed at their inner ends, such as at **22**, to the wall **16** so that when the other ends are fixed to the support **10**, such as at **23**, the wall **16** will be supported a given distance above the table **12** to permit the tongues **15** of the terminals to move beneath the wall while moving on the table **12**. The pairs of guides **20** and **21** extend diagonally from the wall **16** so that there will be smooth traveling of the terminals from engagement with the inner surface **17** of the wall **16** through the outlet **18** and in the guided path controlled by the guides **20** and **21**. Each guide **20** has an integral stop **25** of the curved formation shown so as to engage terminals **14** moving on the table **12** along the inner wall **17** but will not interfere with terminals positioned away from the wall and not in position to move readily through the adjacent outlet **18**.

An entrance end **28** of a chute **29** is mounted to receive the terminals from their respective outlets **18**. These ends of the chutes are mounted on the support **10** and the chutes extend to one or more machines to which the terminals are to be fed for mounting.

It is important that the terminals be oriented so that the major portions of the tongues trail behind as they advance to the mounting machines. In controlling movement of the terminals from the main supply which is supported by the table **12** within the wall **16**, it is advantageous that the tongues **15** be allowed to move out of the supply area and not be wedged above a stack or pile of terminals when they are approaching the outlets **18**. This is the purpose of the space beneath the wall **16** for at this point the important action for consideration is the removal of the terminals singly from the supply area and start their movements along the guides **20** and **21** toward the chutes **29**. During movement of each terminal on the portion of the table outside the wall **16** orientation of the terminals begins for it is here that the rotary movement of this portion of the table turns the terminals in a direction so that the tongues thereof will engage an orienting member **30** of each guide **20** at the entrance end of a ramp **31** extending from the periphery of the table **12** to the entrance end **28** of the chute **29**. At this time, the final orienting movement of each terminal entering the ramp will be completed so that each terminal will be caused to move down its chute with its tongue portion trailing.

Operation

In the present instance, there are six outlets **18** in the wall **16** and, of course, there are six pairs of guides **20** and **21** providing stops **25** for each outlet, and a ramp **31** leading to each chute **29**, the adjacent guide **20**, in each instance, having its orienting member **30**. The portion of the table **12** within the wall **16** may be supplied with terminals through any suitable means not shown and at such a rate that a desired number of terminals may be fed successively through each outlet **18** so that the chutes may have sufficient supplies of terminals properly oriented to be fed to their respective machines. Any suitable means, not shown, may be provided to close any number of outlets should the machines for the chutes associated therewith be made unoperated.

When the table **12** is rotated at the desired speed, terminals resting thereon will be moved outwardly to ride against the inner surface **17** of the wall **16** until they reach the nearest exit **18** wherein the terminals **14** will engage the stops **25** and through the ever present assistance of centrifugal force and the further assistance of stop **25** they will be caused to travel through the outlets and on to the outer portions of the table beyond the wall. Here

the moving force of the table will cause the tongues of the terminals to be moved into given directions so that they will be caused to engage the orienting member **30** in each instance prior to leaving the table **12** or while moving from the table **12** onto the ramp **31**. This completes the orientation of the terminals and they are held in these oriented positions while moving down the ramps to their respective machines.

It is to be understood that the above described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. An apparatus for orienting terminals having tongues extending laterally from like ends thereof and feeding the terminals to a chute comprising:

an annular wall mounted at a fixed position and having an outlet in its lower edge,

a disc-shaped table larger in diameter than the annular wall positioned therebeneath a distance sufficient to permit movement of only the tongues of vertically positioned terminals of a supply of terminals on the table within the wall to extend,

means to rotate the table about its axis at a speed to cause terminals thereon to be moved outwardly by centrifugal force and so that the tongues of the terminals may extend beneath the wall as successive terminals move on the table along an inner surface of the wall to the outlet,

a stationary stop mounted at a far side of the outlet to stop movement of the successive terminals in a circuitous path on the table and direct them through the outlet, and

a guide for the terminals leaving the outlet mounted at a fixed position above the portion of the table extending beyond the wall so that the moving force of the table on tongues of terminals moving along the guide will orient the terminals.

2. An apparatus for orienting terminals having tongues extending laterally from like ends thereof and feeding the terminals to a chute comprising:

an annular wall mounted at a fixed position and having an outlet in its lower edge,

a disc-shaped table larger in diameter than the annular wall positioned therebeneath a distance sufficient to permit movement of only the tongues of vertically positioned terminals of a supply of terminals on the table within the wall to extend,

means to rotate the table about its axis at a speed to cause terminals thereon to be moved outwardly by centrifugal force and so that the tongues of the terminals may extend beneath the wall as successive terminals move on the table along an inner surface of the wall to the outlet,

a stationary stop mounted at a far side of the outlet to stop movement of the successive terminals in a circuitous path on the table and direct them through the outlet,

a guide for the terminals leaving the outlet mounted at a fixed position above the portion of the table extending beyond the wall so that the moving force of the table on tongues of terminals moving along the guide will orient the terminals,

a chute having an entrance end mounted adjacent the guides, and

a ramp disposed adjacent the guide and extending downwardly from the periphery of the table to the entrance of the chute.

3. An apparatus for orienting terminals having tongues extending laterally from like ends thereof and feeding the terminals to a chute comprising:

an annular wall mounted at a fixed position and having an outlet in its lower edge,

a disc-shaped table larger in diameter than the annular wall positioned therebeneath a distance sufficient to permit movement of only the tongues of vertically positioned terminals of a supply of terminals on the table within the wall to extend,

means to rotate the table about its axis at a speed to cause terminals thereon to be moved outwardly by centrifugal force and so that the tongues of the terminals may extend beneath the wall as successive terminals move on the table along an inner surface of the wall to the outlet,

a stationary stop mounted at a far side of the outlet to stop movement of the successive terminals in a circuitous path on the table and direct them through the outlet,

a guide for the terminals leaving the outlet mounted at a fixed position above the portion of the table extending beyond the wall so that the moving force of the table on tongues of terminals moving along the guide will orient the terminals,

a chute having an entrance end mounted adjacent the guide,

a ramp disposed adjacent the guide and extending downwardly from the periphery of the table to the entrance of the chute, and

an abutment member of the guide disposed adjacent the ramp to be engaged by the tongues of the terminals and thereby complete orientation of the terminals prior to their entrance in the chute through the ramp.

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